* NOTICES *

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application]In this invention, use for a camera device, a video camera device, etc., for example, and about a suitable solid state camera, The charge storage time of AGC (automatic gain control circuitry) which amplifies the imaging signal from an iris mechanism and CCD series especially based on a motion and/or luminosity of a photographic subject, and CCD series is controlled. Therefore, when shutter speed (charge storage time of CCD series) becomes high-speed, it is related with the solid state camera which prevented the image pick from becoming dark.

[0002]
[Description of the Prior Art]In today, what is called a handicap type of video camera device is spreading. The function which controls the charge storage time of CCD series according to the motion of a photographic subject called what is called an electronic shutter function is provided in this video camera device.
[0003]This electronic shutter function predicts beforehand a motion of the photographic subject which a user is going to picturize, and shutter speed is set up manually become this predicted speed. If the above-mentioned shutter speed is set up, the above-mentioned video camera device will control the charge storage time of CCD series so that the system controller formed in this video camera device detects this and serves as shutter speed set [above-mentioned] up.
[0004]The high resolution image pick-up which can consider it as the charge storage time suitable for a motion of a photographic subject by this, and does not have Bure can be performed.
[0005]
[Problem(s) to be Solved by the Invention]However, the conventional video camera device with which the above-mentioned electronic shutter function is provided, since it is impossible to change shutter speed rapidly when the motion with an unexpected photographic subject is shown, in order to set up shutter speed beforehand manually -- the account of the upper -- the image pick-up had to be continued with the shutter speed set up beforehand. For this reason, Bure etc. were produced in the picturized picture.
[0006]Here, previously, this applicant detected the motion of a photographic subject and has proposed a solid state camera which controls the charge storage time of CCD series automatically according to a motion of this detected photographic subject.

[0007]However, since the charge storage time of CCD series will become short if shutter speed becomes a high speed (namely, when a motion of a photographic subject becomes intense), the picture which the luminance level of the imaging signal from CCD series fell and picturized may turn into a gloomy picture.
[0008]In making this invention in view of an above-mentioned problem, and being able to change shutter speed automatically according to a motion of a photographic subject, It aims at offer of the solid state camera with which the electronic shutter function that the luminance level of an imaging signal did not fall even if shutter speed becomes high-speed was provided.
[0009]
[Means for Solving the Problem]A solid state camera concerning this invention forms an imaging signal by receiving and carrying out photoelectric conversion of the image pick-up light from a photographic subject with a solid state image pickup device, A motion detecting means detects a motion of a photographic subject from the above-mentioned imaging signal, and forms a motion detection signal, A throttling control means for a control means to be a solid state camera which controls charge storage time of the above-mentioned solid state image pickup device according to the above-mentioned motion detection signal, and to perform light volume adjustment of the above-mentioned image pick-up light, A luminance detection means which detects luminosity from an imaging signal from the above-mentioned solid state image pickup device, and outputs this as a luminosity detecting signal, An above-mentioned technical problem is solved by being characterized by having a diaphragm Kaisei state control means to control the Kaisei state of the above-mentioned throttling control means, based on a motion detection signal from the above-mentioned motion detecting means, and a luminosity detecting signal from a luminance detection means.
[0010]A solid state camera concerning this invention forms an imaging signal by receiving and carrying out photoelectric conversion of the image pick-up light from a photographic subject with a solid state image pickup device, A motion detecting means detects a motion of a photographic subject from the above-mentioned imaging signal, and it a control means, It is a solid state camera which controls charge storage time of the above-mentioned solid state image pickup device according to a motion of a photographic subject detected by the above-mentioned motion detecting means means, A gain variable amplifying means in which variable is possible as for a profit which amplifies and outputs an imaging signal from the above-mentioned solid state image pickup device, A luminance detection means which detects luminosity from an imaging signal from the above-mentioned solid state image pickup device, and outputs this as a luminosity detecting signal, An above-mentioned technical problem is solved by being characterized by having a gain control means which carries out variable control of the profit of the above-mentioned gain variable amplifying means based on a motion detection signal from the above-mentioned motion detecting means, and a luminosity detecting signal from a luminance detection means.
[0011]A solid state camera concerning this invention forms an imaging signal by receiving and carrying out photoelectric conversion of the image pick-up light from a photographic subject with a solid state image pickup device, A motion detecting means detects a motion of a photographic subject from the above-mentioned imaging signal, and forms a motion detection signal, A throttling control means for a control means to be a solid state camera which controls charge storage time of the above-mentioned solid state image pickup device according to the above-mentioned motion detection signal, and to perform light volume adjustment of the above-mentioned image pick-up light, A gain variable amplifying means in which variable is possible as for a profit which amplifies and outputs an imaging

signal from the above-mentioned solid state image pickup device, A luminance detection means which detects luminosity from an imaging signal from the above-mentioned solid state image pickup device, and outputs this as a luminosity detecting signal, A diaphragm Kaisei state control means to control the Kaisei state of the above-mentioned throttling control means based on a motion detection signal from the above-mentioned motion detecting means, and a luminosity detecting signal from a luminance detection means, An above-mentioned technical problem is solved by being characterized by having a gain control means which carries out variable control of the profit of the above-mentioned gain variable amplifying means based on a motion detection signal from the above-mentioned motion detecting means, and a luminosity detecting signal from a luminance detection means.

[0012]As for a solid state camera concerning this invention, Kaisei of the Kaisei state of the above-mentioned throttling control means is filled for the above-mentioned control means, Or/and, when a profit of the above-mentioned gain variable amplifying means turns into the highest profit, an above-mentioned technical problem is solved by being characterized by controlling charge storage time of the above-mentioned solid state image pickup device based on a motion detection signal from the above-mentioned motion detecting means irrespective of a luminosity detecting signal from the above-mentioned luminance detection means.

[0013]As for a solid state camera concerning this invention, Kaisei of the Kaisei state of the above-mentioned throttling control means is filled for the above-mentioned control means, Or/and, when a profit of the above-mentioned gain variable amplifying means turns into the highest profit, based on a luminosity detecting signal from the above-mentioned luminance detection means, an above-mentioned technical problem is solved by being characterized by controlling charge storage time of the above-mentioned solid state image pickup device irrespective of a motion detection signal from the above-mentioned motion detecting means.

[0014]

[Function]The solid state camera concerning this invention is a solid state camera which controls the charge storage time of a solid state image pickup device according to a motion of a photographic subject, The motion detection signal from the motion detecting means which detects a motion of a photographic subject from the imaging signal from the above-mentioned solid state image pickup device, And based on the luminosity detecting signal from the luminance detection means which detects luminosity from the imaging signal from the above-mentioned solid state image pickup device, a diaphragm Kaisei state control means controls the Kaisei state of a throttling control means to perform light volume adjustment of the image pick-up light from a photographic subject, and light volume adjustment of the above-mentioned image pick-up light is performed.

[0015]The solid state camera concerning this invention is a solid state camera which controls the charge storage time of a solid state image pickup device according to a motion of a photographic subject, The motion detection signal from the motion detecting means which detects a motion of a photographic subject from the imaging signal from the above-mentioned solid state image pickup device, And based on the luminosity detecting signal from the luminance detection means which detects luminosity from the imaging signal from the above-mentioned solid state image pickup device, a gain control means carries out variable control of the profit of the gain variable amplifying means in which variable is possible as for the profit which amplifies and outputs the imaging signal from the above-mentioned solid state image pickup device, and the luminance level of an imaging signal is adjusted.

[0016]The solid state camera concerning this invention is a solid state camera which controls the charge

storage time of a solid state image pickup device according to a motion of a photographic subject, The motion detection signal from the motion detecting means which detects a motion of a photographic subject from the imaging signal from the above-mentioned solid state image pickup device, And while a diaphragm Kaisei state control means controls the Kaisei state of a throttling control means to perform light volume adjustment of the image pick-up light from a photographic subject based on the luminosity detecting signal from the luminance detection means which detects luminosity from the imaging signal from the above-mentioned solid state image pickup device, A gain control means carries out variable control of the profit of the gain variable amplifying means in which variable is possible as for the profit which amplifies and outputs the imaging signal from the above-mentioned solid state image pickup device, and light volume adjustment of image pick-up light and the luminance level of an imaging signal are adjusted.

[0017]As for the solid state camera concerning this invention, Kaisei of the Kaisei state of the above-mentioned throttling control means is filled for a control means, Or/and, when the profit of the above-mentioned gain variable amplifying means turns into the highest profit, Irrespective of the luminosity detecting signal from the above-mentioned luminance detection means, it picturizes by giving priority to the Bure prevention of an image pick over the luminance level of an imaging signal by controlling the charge storage time of the above-mentioned solid state image pickup device based on the motion detection signal from the above-mentioned motion detecting means.

[0018]As for the solid state camera concerning this invention, Kaisei of the Kaisei state of the above-mentioned throttling control means is filled for a control means, Or/and, when the profit of the above-mentioned gain variable amplifying means turns into the highest profit, Irrespective of the motion detection signal from the above-mentioned motion detecting means, it picturizes by giving priority to the luminosity of an image pick rather than the Bure prevention of an image pick based on the luminosity detecting signal from the above-mentioned luminance detection means by controlling the charge storage time of the above-mentioned solid state image pickup device.

[0019]

[Example]It explains in detail, referring to drawings for the example of the solid state camera concerning this invention hereafter. The iris mechanism 1 in which the solid state camera concerning the example of this invention is a throttling control means to perform light volume adjustment of the image pick-up light from a photographic subject as shown in drawing 1, CCD series 2 which is a solid state image pickup device which receives the image pick-up light irradiated via the above-mentioned iris mechanism 1, performs photoelectric conversion, and forms and outputs an imaging signal, The profit which amplifies and outputs the imaging signal from above-mentioned CCD series 2 has the automatic gain control circuitry (AGC) 3 which is a gain variable amplifying means in which variable is possible, and A/D converter 4 which digitizes the imaging signal of the analog from the above-mentioned AGC3, and forms and outputs imaging data.

[0020]The matrix circuit 6 which the solid state camera of the above-mentioned example extracts a luminosity (Y) signal from the imaging signal from above-mentioned CCD series 2, and is outputted, A/D converter 7 which digitizes the luminance signal which is an analog signal from the above-mentioned matrix circuit 6, and forms and outputs luminance data, The motion vector sensing device 8 which is a motion detecting means which detects a motion of a photographic subject from the luminance data from above-mentioned A/D converter 7, and outputs this as a motion vector which is a motion detection signal, The level of the luminance data from above-mentioned A/D converter 7 is detected, and it has the

luminance level detecting circuit 9 which is a luminance detection means which outputs this as luminosity detected information which is a luminosity detecting signal.

[0021]The solid state camera of the above-mentioned example The imaging data from above-mentioned A/D converter 4, While controlling a diaphragm of the above-mentioned iris mechanism 1 and controlling the charge storage time of above-mentioned CCD series 2 based on the luminosity detected information from the motion vector and the above-mentioned luminance level detecting circuit 9 from the above-mentioned motion vector sensing device 8, It has the system controller 10 which is the diaphragm Kaisei state control means, control means, and gain control means which carry out variable control of the profit of above-mentioned AGC3.

[0022]Next, operation of the solid state camera concerning the example which has such composition is explained according to the flow chart shown in drawing 2.

[0023]By one [the main power of the above-mentioned solid state camera], the flow chart shown in this drawing 2 is started, and progresses to Step S1.

[0024]In the above-mentioned step S1, the above-mentioned system controller 10 changes the Kaisei state of the above-mentioned iris mechanism 1 into the Kaisei state at the time of initial setting, Charge storage time of CCD series 2 is made into the charge storage time at the time of initial setting, the above-mentioned AGC3 is controlled, respectively to become a profit at the time of initial setting, and it progresses to Step S2.

[0025]In the above-mentioned step S2, the image pick-up of a photographic subject is actually started, and it progresses to Step S3 and step S4.

[0026]If an image pick-up is started in the above-mentioned step S2, image pick-up light will be irradiated by above-mentioned CCD series 2 via the above-mentioned iris mechanism 1 which it changed into the Kaisei state of initial setting. Above-mentioned CCD series 2 receives a part for the charge storage time at the time of the above-mentioned initial setting, and the above-mentioned image pick-up light, and supplies them to the above-mentioned AGC3 and the matrix circuit 6 by making into an imaging signal the electric charge accumulated by this image pick-up light. The above-mentioned AGC3 amplifies the above-mentioned imaging signal on the profit by which initial setting was carried out [above-mentioned], and it supplies it to A/D converter 4 while supplying the video signal process circuit which does not illustrate this via the output terminal 5. By digitizing the above-mentioned imaging signal which is an analog signal, above-mentioned A/D converter 4 forms imaging data, and supplies this imaging data to the above-mentioned system controller 10.

[0027]On the other hand, the above-mentioned matrix circuit 6 extracts a luminance signal from the above-mentioned imaging signal, and supplies this luminance signal to A/D converter 7. By digitizing the above-mentioned luminance signal which is an analog signal, above-mentioned A/D converter 7 forms luminance data, and supplies this luminance data to the motion vector sensing device 8 and the luminance level detecting circuit 9.

[0028]The above-mentioned step S3 and step S4 are steps which the above-mentioned motion vector sensing device 8 and the luminance level detecting circuit 9 perform simultaneously.

[0029]In the above-mentioned step S3, based on the above-mentioned luminance data, the above-mentioned motion vector detection circuit 8 detects a motion of a photographic subject using the representative point block matching method explained below, forms a motion vector, and it progresses to Step S5.

[0030]Namely, as shown in drawing 3 (a), the above-mentioned motion vector sensing device 8 the

imaging region 40, For example, it divides into the 1st - the 16th subregion (henceforth a macro block) 41a-41p, The pixel located in the center of each of these macro blocks 41a-41p is made into the representative point 44, and the shaking hand vector under image pick-up is detected by detecting the correlativity of the luminance data applied to the above-mentioned representative point 44 between the fields at every above-mentioned macro block 41a - 41p. As shown in drawing 3 (b), the above-mentioned motion vector sensing device 8 the field 42 of the center portion of the imaging range 40, For example, divide into the 1st - the 16th macro block 43a-43p, and the pixel located in the center of each of these macro blocks 43a-43p is made into the representative point 45, The motion vector of a photographic subject is detected by detecting the correlativity of the luminance data applied to the above-mentioned representative point 45 between the fields at every above-mentioned macro block 43a - 43p. And a motion vector is detected by the representative point block matching method which forms and outputs the above-mentioned motion vector based on the above-mentioned shaking hand vector.

[0031]As shown, for example in drawing 4, it specifically divides roughly, and it comprises the motion vector detection circuit 32 which detects the motion vector of a photographic subject based on the shaking hand vector from the shaking hand vector detector circuit 26 and the above-mentioned shaking hand vector detector circuit 26 which detects the above-mentioned shaking hand vector.

[0032]The representative point memory 21 for shaking hand vector detection which memorizes the luminance data which the above-mentioned shaking hand vector detector circuit 26 requires for each representative point 44 of each above-mentioned macro blocks 41a-41p shown in above-mentioned drawing 3 (a), . Polarity is reversed and read from the above-mentioned representative point memory 21 for shaking hand vector detection. The adding machine 22 which carries out summing processing of the luminance data concerning the above-mentioned representative point 44 of a previous field, and the luminance data of the present field, and forms and outputs correlation value data, The absolute-value circuit 23 which detects the absolute value of the correlation value data from the above-mentioned adding machine 22, the [the 1st which detects a motion of a photographic subject to each above-mentioned macro block 41a - every 41p -] -- with the macro block motion detection parts 24a-24p of 16. the [the above 1st -] -- it comprises the shaking hand vector detector circuit 25 which detects a shaking hand vector from the correlation value data concerning each macro blocks 41a-41p supplied from the macro block motion detection parts 24a-24p of 16.

[0033]The representative point memory 27 for photographic subject motion vector detection which memorizes the luminance data which the above-mentioned motion vector detection circuit 32 requires for each representative point 45 of each macro blocks 43a-43p of the center portion 42 of the described image field 40 shown in above-mentioned drawing 3 (b), . Polarity is reversed and read from the above-mentioned representative point memory 27 for photographic subject motion vector detection. The adding machine 28 which carries out summing processing of the luminance data concerning the above-mentioned representative point 45 of a previous field, and the luminance data of the present field, and forms and outputs correlation value data, The absolute-value circuit 29 which detects the absolute value of the correlation value data from the above-mentioned adding machine 28, the [the 1st which detects a motion of a photographic subject to each above-mentioned macro block 43a - every 43p -] -- with the macro block motion detection parts 30a-30p of 16. being based on the shaking hand vector from the above-mentioned shaking hand vector primary detecting element 25 -- the [the above 1st -] -- it comprises the motion vector primary detecting element 31 which detects the correlation-value-data lost-motion vector concerning each macro blocks 43a-43p supplied from the macro block motion detection

parts 30a-30p of 16.
[0034]In the motion vector sensing device 8 which has such composition, the luminance data from A/D converter 7 shown in above-mentioned drawing 1 is supplied to the above-mentioned representative point memory 21 for shaking hand vector detection, the adding machine 22, the representative point memory 27 for photographic subject motion vector detection, and the adding machine 28 via the input terminal 20.
[0035]The above-mentioned representative point memory 21 for shaking hand vector detection once memorizes the luminance data concerning each representative point 44 of each macro blocks 41a-41p shown in above-mentioned drawing 3 (a). Polarity is reversed by the read pulse from the system controller 10 shown in above-mentioned drawing 1, it is read, delay of the 1 field is given, and this memorized luminance data is supplied to the above-mentioned adding machine 22.
[0036]The above-mentioned adding machine 22 detects the difference (correlativity) by carrying out summing processing of the luminance data of the previous field concerning each above-mentioned representative point 44, and the luminance data of the present field. By this, the correlation value data of each above-mentioned macro block 41a - every 41p will be detected. The correlation value data of each of this macro block 41a - every 41p is supplied to the absolute value detecting circuit 23, respectively.
[0037]the above-mentioned absolute value detecting circuit 23 detects the absolute value of each above-mentioned correlation value data -- this -- the [the above 1st -] -- the macro block motion detection parts 24a-24p of 16 are supplied.
[0038]the [the above 1st -] -- the macro block motion detection parts 24a-24p of 16 detect the motion vector of a photographic subject based on the correlation value data from the above-mentioned absolute value detecting circuit 23, respectively. By this, in each above-mentioned macro block motion detection parts 24a-24p, the motion vector of the photographic subject of each above-mentioned macro block 41a - every 41p will be detected. Each of this motion vector is supplied to the shaking hand vector detector circuit 25, respectively.
[0039]The above-mentioned shaking hand vector detector circuit 25 detects the minimum of the motion vector detected by each above-mentioned macro block 41a - every 41p, and supplies it to the motion vector primary detecting element 31 in the motion vector detection circuit 32 by making this into a shaking hand vector.
[0040]On the other hand, the above-mentioned representative point memory 27 for motion vector detection once memorizes the luminance data concerning each representative point 45 of each macro blocks 43a-43p shown in above-mentioned drawing 3 (b). Polarity is reversed by the read pulse from the system controller 10 shown in above-mentioned drawing 1, it is read, delay of the 1 field is given, and this memorized luminance data is supplied to the above-mentioned adding machine 28.
[0041]The above-mentioned adding machine 28 detects the difference (correlativity) by carrying out summing processing of the luminance data of the previous field concerning each above-mentioned representative point 45, and the luminance data of the present field. By this, the correlation value data of each above-mentioned macro block 43a - every 43p will be detected. The correlation value data of each of this macro block 43a - every 43p is supplied to the absolute value detecting circuit 29, respectively.
[0042]the above-mentioned absolute value detecting circuit 29 detects the absolute value of each above-mentioned correlation value data -- this -- the [the 1st -] -- the macro block motion detection parts 30a-30p of 16 are supplied.
[0043]the [the above 1st -] -- the macro block motion detection parts 30a-30p of 16 detect the motion

vector of a photographic subject based on the correlation value data from the above-mentioned absolute value detecting circuit 29, respectively. By this, in each above-mentioned macro block motion detection parts 30a-30p, the motion vector of the photographic subject of each above-mentioned macro block 43a - every 43p will be detected. Each of this motion vector is supplied to the motion vector detection circuit 31, respectively.

[0044]The above-mentioned motion vector detection circuit 31 detects the minimum of the motion vector detected by each above-mentioned macro block 43a - every 43p based on the shaking hand vector supplied from the above-mentioned shaking hand vector primary detecting element 25, and outputs it via the output terminal 33 by making this into a motion vector. The motion vector outputted via this output terminal 33 is supplied to the system controller 10 shown in drawing 1.

[0045]In the above-mentioned step S4, the above-mentioned luminance level detecting circuit 9 measures a luminance level from the luminance data supplied from above-mentioned A/D converter 7, the luminance level data which is this measurement data is supplied to the above-mentioned system controller 10, and it progresses to Step S5.

[0046]In the above-mentioned step S5, the above-mentioned system controller 10 determines the charge storage time (shutter speed) of above-mentioned CCD series 2 based on the luminance level data supplied from the motion vector supplied from the above-mentioned motion vector sensing device 8, and the above-mentioned luminance level detecting circuit 9. And the charge storage time of above-mentioned CCD series 2 is controlled, and it progresses to Step S6 so that it may become this determined shutter speed.

[0047]In the above-mentioned step S6, the luminance level to the shutter speed determined in the above-mentioned step S5 is presumed, and the above-mentioned system controller 10 carries out variable control of the profit of above-mentioned AGC3, and progresses to Step S7 so that it may be set to this luminance level.

[0048]In the above-mentioned step S7, the above-mentioned system controller 10 detects the level of the imaging data supplied from above-mentioned A/D converter 4. And from the level of this imaging data, he distinguishes whether the profit of above-mentioned AGC3 is the maximum, and, in NO, follows it to Step S10, and, in YES, it progresses to Step S8.

[0049]Since the profit of above-mentioned AGC3 is a limit, it controls by the above-mentioned step S10 so that the above-mentioned system controller 10 opens the above-mentioned iris mechanism 1 fully. And he distinguishes whether the luminance level data supplied from the above-mentioned luminance level detecting circuit 9 at this time is a fitness luminance level, and, in NO, follows it to Step S11, and, in YES, it progresses to Step S12.

[0050]Since the above-mentioned luminance level data does not serve as a fitness level in the above-mentioned step S11 even if the profit of above-mentioned AGC3 opens the maximum and the above-mentioned iris mechanism 1 fully, The above-mentioned system controller 10 controls the shutter speed of above-mentioned CCD series 2 to become top speed, or controls the shutter speed of above-mentioned CCD series 2 to be set to a fitness luminance level [above-mentioned] level, and progresses to Step S8.

[0051]Namely, in this step S11, it picturizes by giving priority to shutter speed over the luminance level of an imaging signal, or picturizes by giving priority to a luminance level over shutter speed. When this picturizes by giving priority to shutter speed over the luminance level of an imaging signal, Although some image picks become dark, when it can obtain an image pick without Bure and picturizes by giving

priority to a luminance level over shutter speed, some Bure can get a bright image pick to it, although generated in an image pick.

[0052]Since it became what has a fitness luminance level by the profit of above-mentioned AGC3, the above-mentioned system controller 10 controls the Kaisei state of the above-mentioned iris mechanism 1 by the above-mentioned step S12, and progresses to Step S8 at it so that it may be set to a still fitness luminance level.

[0053]Each of these circuits are controlled by the above-mentioned step S8, and it progresses to step S9 at it so that the above-mentioned system controller 10 may picturize on the diaphragm (iris mechanism 1), the shutter speed (CCD series 2), and the profit (AGC3) which were set up as mentioned above.

[0054]In the above-mentioned step S9, by controlling the profit of above-mentioned AGC3, the above-mentioned system controller 10 copes with change of some luminance levels, and is completed.

[0055]Thus, by controlling the Kaisei state of the above-mentioned iris mechanism 1, the charge storage time of CCD series, and the profit of AGC3 based on a motion, luminance level, and imaging signal level of a photographic subject, The automatic control of the charge storage time of CCD series 2 according to a motion of a photographic subject can be performed after also taking the luminance level of an imaging signal into consideration.

[0056]For this reason, it can picturize with a fitness always luminance level, and the inconvenience accompanying the automatic control of the charge storage time of above-mentioned CCD series 2 that an image pick becomes dark can be prevented.

[0057]When the Kaisei state of the above-mentioned iris mechanism 1 and the profit of above-mentioned AGC3 become a limit, it can picturize by the ability to give priority to shutter speed over the luminance level of an imaging signal, or can picturize by giving priority to a luminance level over shutter speed. For this reason, when it picturizes by giving priority to shutter speed over the luminance level of the above-mentioned imaging signal, Although some image picks become dark, when it can obtain an image pick without Bure and picturizes by giving priority to a luminance level over the above-mentioned shutter speed, some Bure can get a bright image pick to it, although generated in an image pick.

[0058]Although it presupposed the above-mentioned motion vector sensing device 8 that a motion vector is detected by the representative point block matching method in explanation of the above-mentioned example, This may detect a motion vector, for example by what is called a usual block matching method, or it may be made to detect a motion vector with what is called a gradient method.

[0059]

[Effect of the Invention]The solid state camera concerning this invention is a solid state camera which controls the charge storage time of a solid state image pickup device according to a motion of a photographic subject, The motion detection signal from the motion detecting means which detects a motion of a photographic subject from the imaging signal from the above-mentioned solid state image pickup device, And based on the luminosity detecting signal from the luminance detection means which detects luminosity from the imaging signal from the above-mentioned solid state image pickup device, By a diaphragm Kaisei state control means' controlling the Kaisei state of a throttling control means to perform light volume adjustment of the image pick-up light from a photographic subject, and performing light volume adjustment of the above-mentioned image pick-up light, the fall of the luminance level of the imaging signal accompanying improvement in the speed of shutter speed can be prevented, and the image pick of a fitness luminosity can be obtained.

[0060]The solid state camera concerning this invention is a solid state camera which controls the charge storage time of a solid state image pickup device according to a motion of a photographic subject, The motion detection signal from the motion detecting means which detects a motion of a photographic subject from the imaging signal from the above-mentioned solid state image pickup device, And based on the luminosity detecting signal from the luminance detection means which detects luminosity from the imaging signal from the above-mentioned solid state image pickup device, By a gain control means's carrying out variable control of the profit of the gain variable amplifying means in which variable is possible as for the profit which amplifies and outputs the imaging signal from the above-mentioned solid state image pickup device, and adjusting the luminance level of an imaging signal, The fall of the luminance level of the imaging signal accompanying improvement in the speed of shutter speed can be prevented, and the image pick of a fitness luminosity can be obtained.
[0061]The solid state camera concerning this invention is a solid state camera which controls the charge storage time of a solid state image pickup device according to a motion of a photographic subject, The motion detection signal from the motion detecting means which detects a motion of a photographic subject from the imaging signal from the above-mentioned solid state image pickup device, And while a diaphragm Kaisei state control means controls the Kaisei state of a throttling control means to perform light volume adjustment of the image pick-up light from a photographic subject based on the luminosity detecting signal from the luminance detection means which detects luminosity from the imaging signal from the above-mentioned solid state image pickup device, By a gain control means's carrying out variable control of the profit of the gain variable amplifying means in which variable is possible as for the profit which amplifies and outputs the imaging signal from the above-mentioned solid state image pickup device, and adjusting light volume adjustment of image pick-up light, and the luminance level of an imaging signal, The fall of the luminance level of the imaging signal accompanying improvement in the speed of shutter speed can be prevented, and the image pick of a fitness luminosity can be obtained.
[0062]As for the solid state camera concerning this invention, Kaisei of the Kaisei state of the above-mentioned throttling control means is filled, Or/and, when the profit of the above-mentioned gain variable amplifying means turns into the highest profit, Although a control means serves as a dark picture somewhat by controlling the charge storage time of the above-mentioned solid state image pickup device based on the motion detection signal from the above-mentioned motion detecting means irrespective of the luminosity detecting signal from the above-mentioned luminance detection means, Bure of an image pick can be prevented.
[0063]As for the solid state camera concerning this invention, Kaisei of the Kaisei state of the above-mentioned throttling control means is filled, Or/and, when the profit of the above-mentioned gain variable amplifying means turns into the highest profit, When a control means controls the charge storage time of the above-mentioned solid state image pickup device based on the luminosity detecting signal from the above-mentioned luminance detection means irrespective of the motion detection signal from the above-mentioned motion detecting means, some Bure is produced in an image pick, but a bright image pick can be obtained.

[Translation done.]

* NOTICES *

CLAIMS

[Claim(s)]
[Claim 1]An imaging signal is formed by receiving and carrying out photoelectric conversion of the image pick-up light characterized by comprising the following from a photographic subject with a solid state image pickup device, A solid state camera that a motion detecting means detects a motion of a photographic subject from the above-mentioned imaging signal, and forms a motion detection signal, and a control means controls charge storage time of the above-mentioned solid state image pickup device according to the above-mentioned motion detection signal.
A throttling control means to perform light volume adjustment of the above-mentioned image pick-up light.
A luminance detection means which detects luminosity from an imaging signal from the above-mentioned solid state image pickup device, and outputs this as a luminosity detecting signal.
A diaphragm Kaisei state control means to control the Kaisei state of the above-mentioned throttling control means based on a motion detection signal from the above-mentioned motion detecting means, and a luminosity detecting signal from a luminance detection means.

[Claim 2]An imaging signal is formed by receiving and carrying out photoelectric conversion of the image pick-up light characterized by comprising the following from a photographic subject with a solid state image pickup device, A solid state camera with which a motion detecting means detects a motion of a photographic subject from the above-mentioned imaging signal, and a control means controls charge storage time of the above-mentioned solid state image pickup device according to a motion of a photographic subject detected by the above-mentioned motion detecting means means.
A gain variable amplifying means in which variable is possible as for a profit which amplifies and outputs an imaging signal from the above-mentioned solid state image pickup device.
A luminance detection means which detects luminosity from an imaging signal from the above-mentioned solid state image pickup device, and outputs this as a luminosity detecting signal.
A gain control means which carries out variable control of the profit of the above-mentioned gain variable amplifying means based on a motion detection signal from the above-mentioned motion detecting means, and a luminosity detecting signal from a luminance detection means.

[Claim 3]An imaging signal is formed by receiving and carrying out photoelectric conversion of the image pick-up light characterized by comprising the following from a photographic subject with a solid

state image pickup device, A solid state camera that a motion detecting means detects a motion of a photographic subject from the above-mentioned imaging signal, and forms a motion detection signal, and a control means controls charge storage time of the above-mentioned solid state image pickup device according to the above-mentioned motion detection signal.
A throttling control means to perform light volume adjustment of the above-mentioned image pick-up light.
A gain variable amplifying means in which variable is possible as for a profit which amplifies and outputs an imaging signal from the above-mentioned solid state image pickup device.
A luminance detection means which detects luminosity from an imaging signal from the above-mentioned solid state image pickup device, and outputs this as a luminosity detecting signal.
A diaphragm Kaisei state control means to control the Kaisei state of the above-mentioned throttling control means based on a motion detection signal from the above-mentioned motion detecting means, and a luminosity detecting signal from a luminance detection means, A gain control means which carries out variable control of the profit of the above-mentioned gain variable amplifying means based on a motion detection signal from the above-mentioned motion detecting means, and a luminosity detecting signal from a luminance detection means.

[Claim 4]Kaisei of the Kaisei state of the above-mentioned throttling control means being filled, or/and the above-mentioned control means, When a profit of the above-mentioned gain variable amplifying means turns into the highest profit, irrespective of a luminosity detecting signal from the above-mentioned luminance detection means, Claim 1 controlling charge storage time of the above-mentioned solid state image pickup device based on a motion detection signal from the above-mentioned motion detecting means, claim 2, or the solid state camera according to claim 3.
[Claim 5]Kaisei of the Kaisei state of the above-mentioned throttling control means being filled, or/and the above-mentioned control means, When a profit of the above-mentioned gain variable amplifying means turns into the highest profit, irrespective of a motion detection signal from the above-mentioned motion detecting means, Claim 1 characterized by controlling charge storage time of the above-mentioned solid state image pickup device based on a luminosity detecting signal from the above-mentioned luminance detection means, claim 2, or the solid state camera according to claim 3.

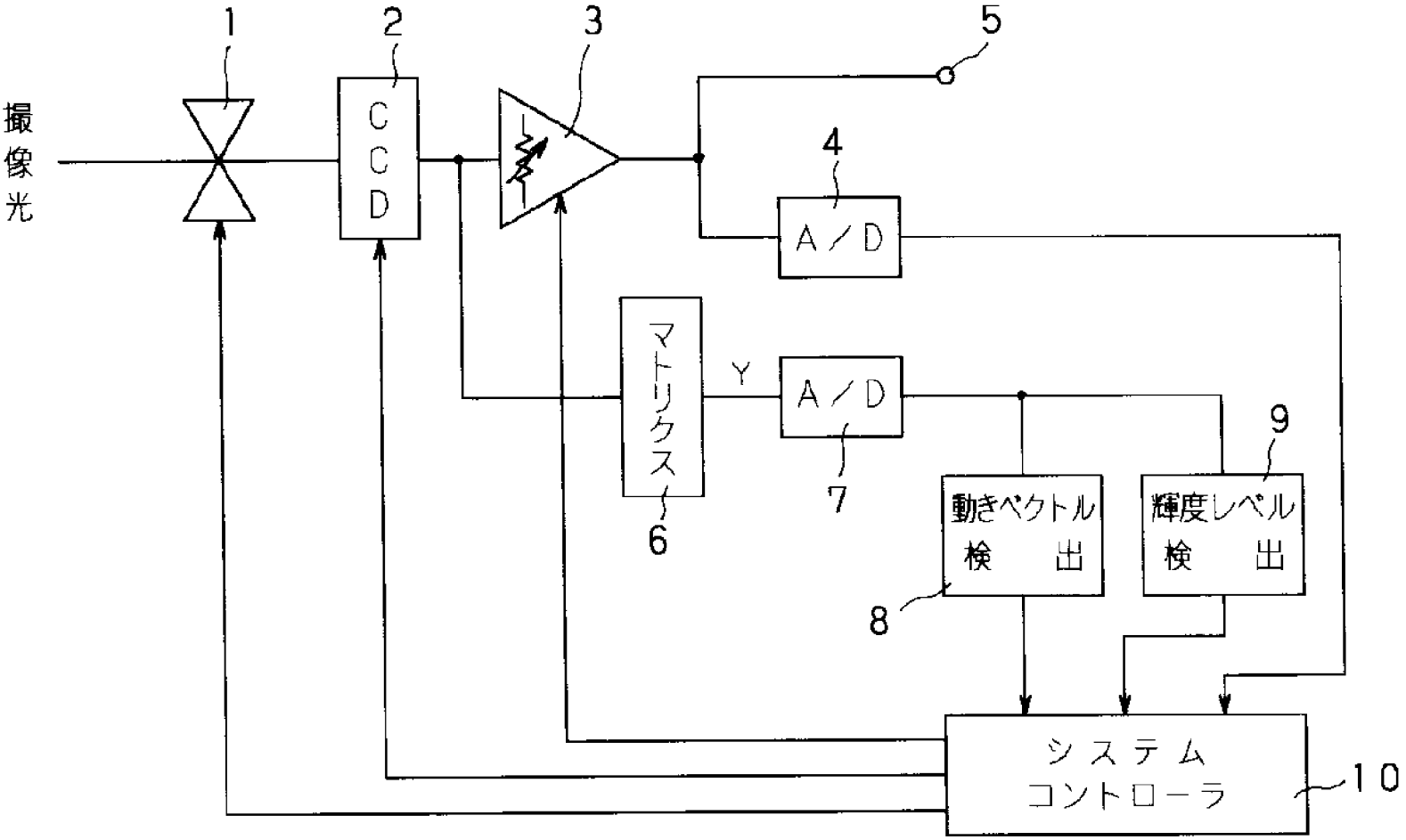
[Translation done.]

* NOTICES *

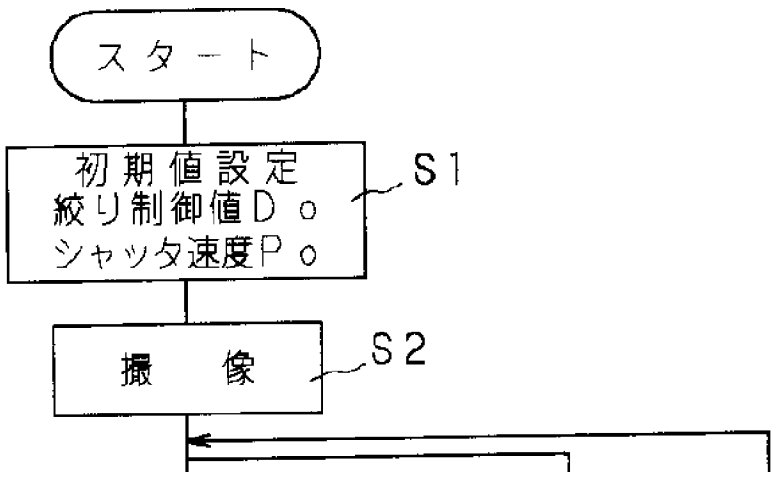
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

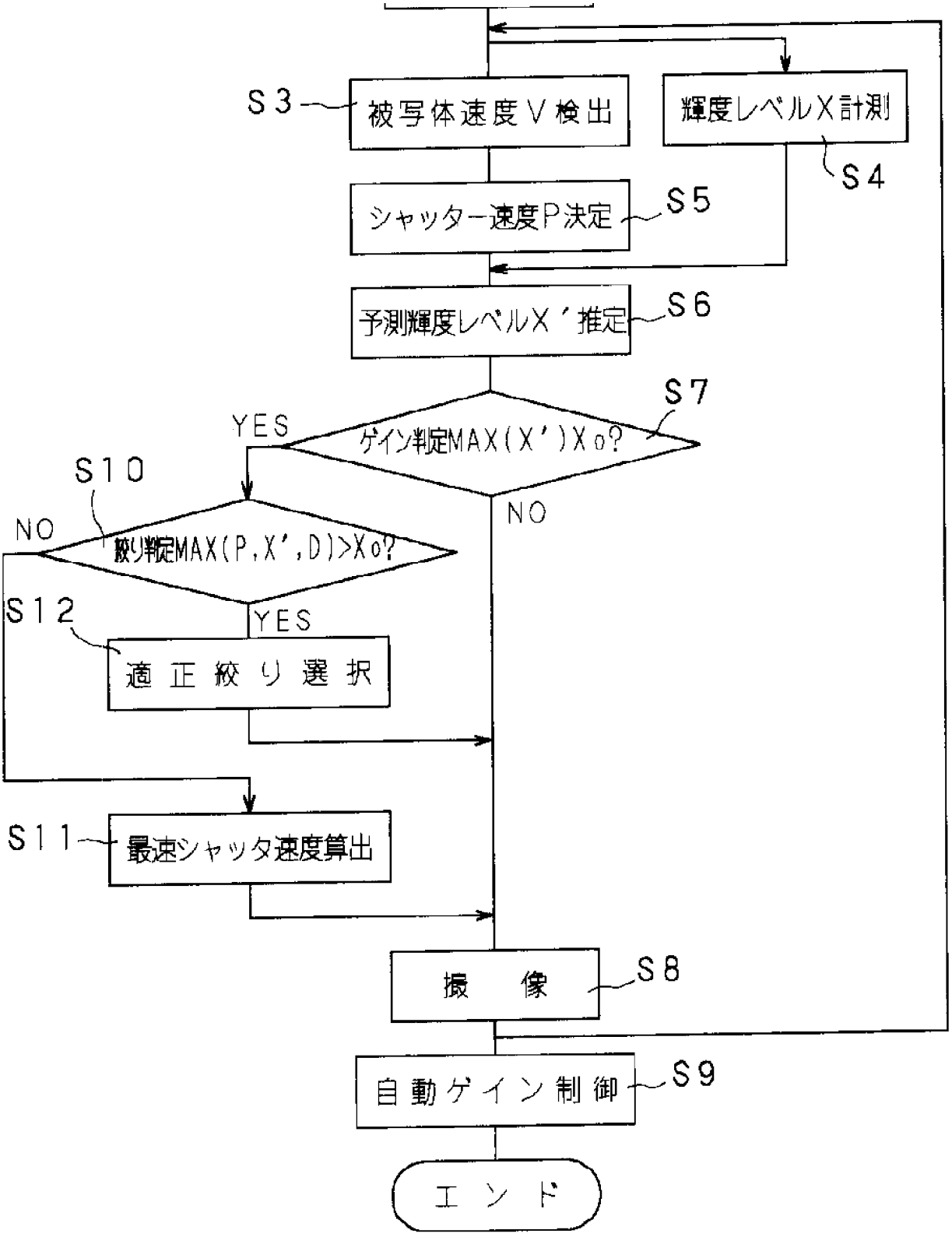
DRAWINGS

[Drawing 1]



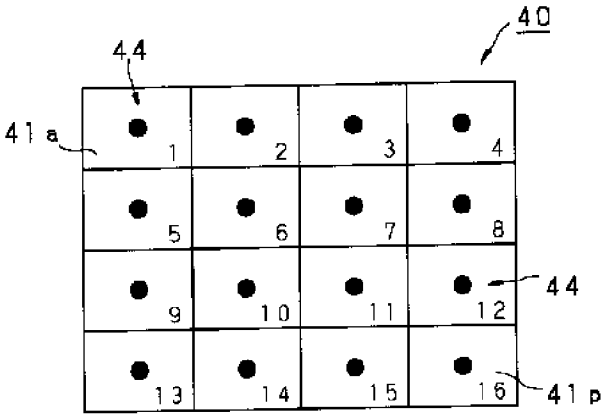
[Drawing 2]



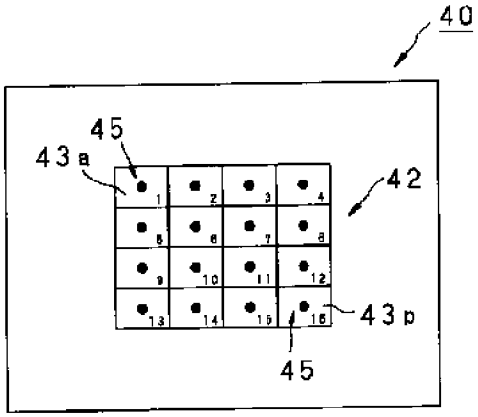

S3
被写体速度V検出
輝度レベルX計測
S4
シャッター速度P決定
S5
予測輝度レベルX′推定
S6
S7
YES
ゲイン判定MAX(X′)Xo?
NO
S10
NO
絞り判定MAX(P,X′,D)>Xo?
S12
YES
適正絞り選択
S11
最速シャッタ速度算出
撮像
S8
自動ゲイン制御
S9
エンド

[Drawing 3]

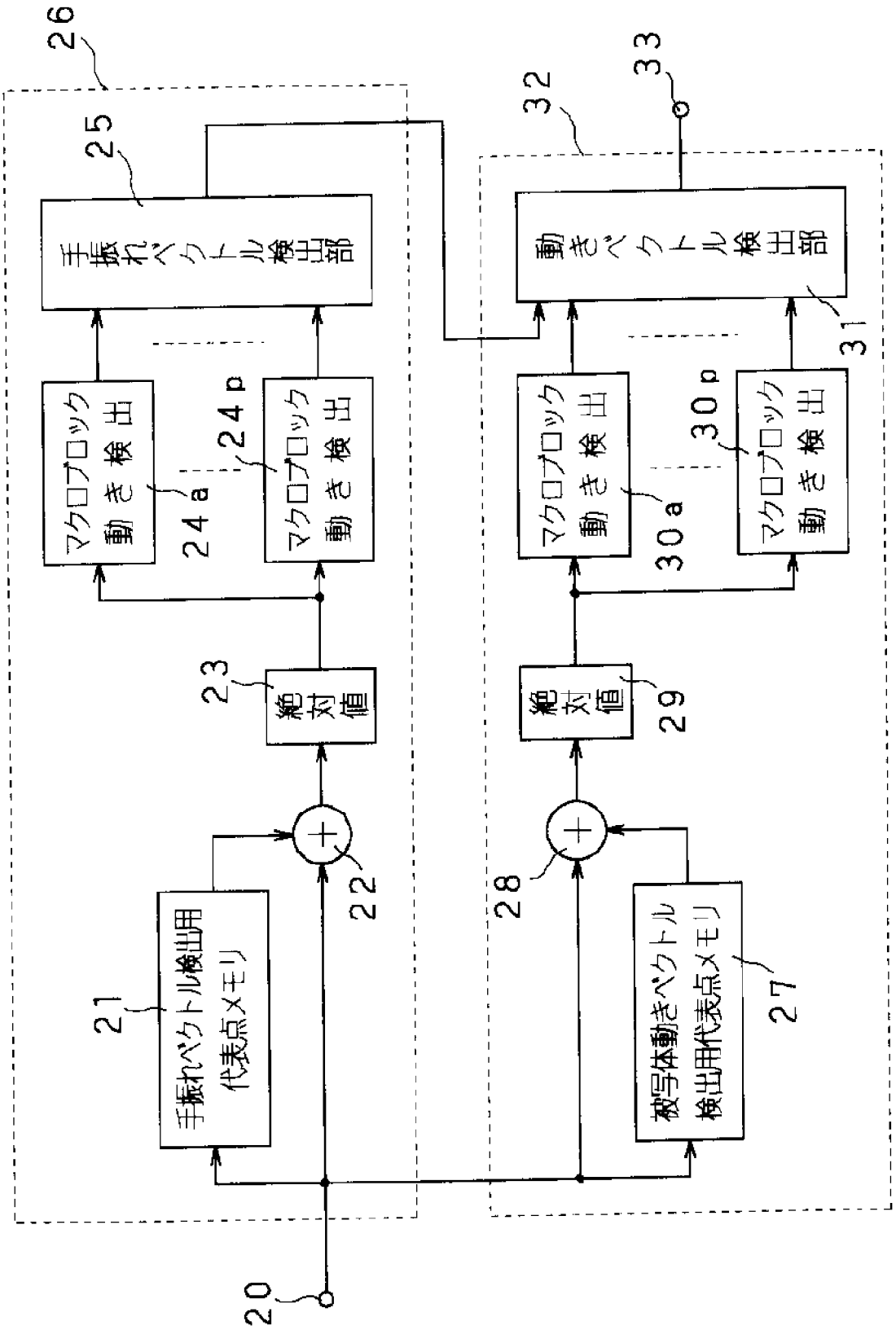
(a)



(b)



[Drawing 4]



[Translation done.]